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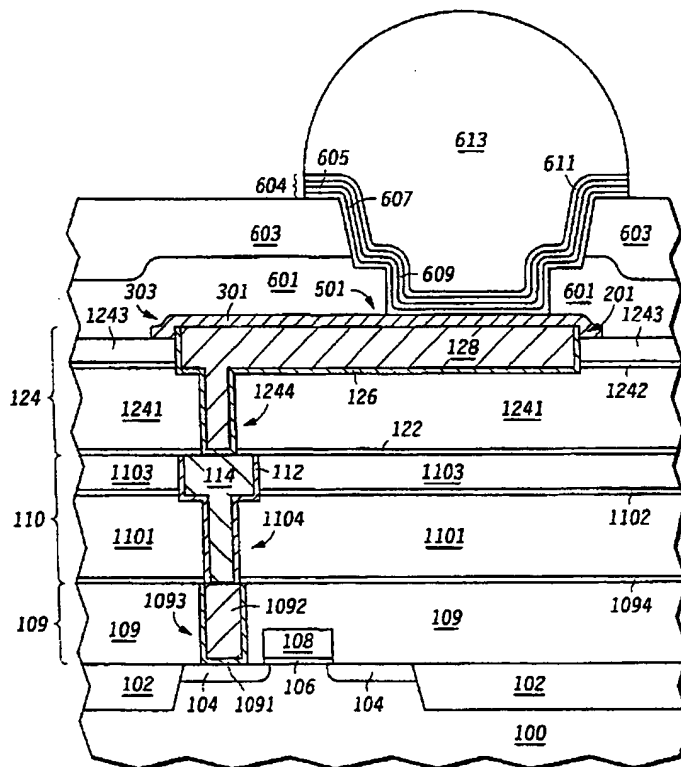
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[Continued on next page]

(54) Title: SEMICONDUCTOR DEVICE AND METHOD OF FORMATION



(57) Abstract: A semiconductor device and its method of formation are disclosed wherein a surface of a semiconductor substrate is planarized to form an interconnect (1244) within a dielectric layer (1243). The top surface of the dielectric layer is then recessed with respect to a top surface of the interconnect to form a step (201). An opaque film (301) is then deposited over the surface of the semiconductor substrate. The opaque film (301) is lithographically patterned and etched, wherein an alignment of the patterning layer (401) is accomplished using topographically discernable features (303) that are formed in the opaque film (301) in regions where the step (201) between the interconnect (1244) and dielectric layer (1243) is produced.

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# INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 H01L21/768 H01L21/60

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H01L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |
|------------|--|-----------------------|
| X          | US 5 863 825 A (OSUGI RICHARD ET AL)<br>26 January 1999 (1999-01-26)<br>column 2, line 42 -column 3, line 14<br>column 3, line 48 -column 4, line 5;<br>figures 2,5,6  | 1,5                   |
| X<br>A     | WO 99 08314 A (OKAMOTO YOSHIHIKO ;HITACHI LTD (JP)) 18 February 1999 (1999-02-18)<br>abstract<br>page 20, line 24 -page 22, line 16<br>page 23, line 22 -page 24, line 13<br>page 25, line 10 -page 26, line 22<br>page 33, line 23 -page 36, line 9<br>page 40, line 24 -page 45, line 17<br>page 52, line 22 -page 54, line 14;<br>figures 9-13,18-21,23-26,33-41,48-58,76-81<br>-/- | 1<br>2-4,6-10         |

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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
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| X<br>A     | US 6 020 263 A (YU CHEN-HUA ET AL)<br>1 February 2000 (2000-02-01)<br>column 3, line 64 -column 5, line 43;<br>claim 1; figures 7A,8,9<br>----- | 1<br>5,9              |

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

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| Patent document<br>cited in search report |   | Publication<br>date |      | Patent family<br>member(s) | Publication<br>date |
|---|---|---------------------|------|----------------------------|---------------------|
| US 5863825                                | A | 26-01-1999          | JP   | 11186162 A                 | 09-07-1999          |
| WO 9908314                                | A | 18-02-1999          | WO   | 9908314 A1                 | 18-02-1999          |
| US 6020263                                | A | 01-02-2000          | NONE |                            |                     |

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